

# A SOWING METHOD OF THE PLANT SEEDS AND THE SOWING MATERIALS USED THEREOF

## FIELD OF THE INVENTION

5       The present invention is related to a sowing method of the plant seeds and the sowing materials used thereof, and particularly to a sowing method of the plant seeds inlaid in a weed-growth-preventing mulching paper and a weed-growth-preventing mulching paper used thereof.

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## BACKGROUND OF THE INVENTION

Generally, the agricultural production comprises the steps of land-preparation, sowing, fertilization, hand weeding and harvest. Each step requires a huge amount of men power. Particularly, the step of hand  
15 weeding especially requires a huge amount of men power which always delays the organic farming for a period of time. To proceed the step of weed-removal, the farmers conventionally cover the black plastic film over the land for preventing the weeds from growing. However, after the crops are harvested, the farmers don't know how to deal with the  
20 useless black plastic film. Besides, because the black plastic film can't be decomposed naturally, it thus tends to result in environmental pollution once the black plastic film is discarded. Therefore, nowadays, a new method of agricultural production for satisfying the requirement of weed-removal and preventing from resulting in the problem of  
25 environmental pollution attracts a large number of researchers' attention.

## SUMMARY OF THE INVENTION

An object of the present invention is to provide a sowing method for increasing the emergence rate of the plant seeds.

Another object of the present invention is to provide a sowing method for increasing the production amount of the crops.

5 A further object of the present invention is to provide a method for simultaneously proceeding the steps of sowing, soil-covering and weed-removal for agricultural production.

In a first aspect, the present invention is related to a sowing method of the plant seeds. The sowing method comprises the steps of a) 10 providing a base with water-absorbing ability and humidity-maintaining ability, wherein the base includes a plurality of concavities, b) inlaying the plant seeds in the plural concavities of the base, and c) covering a cultivating material with the base, wherein each concavity has a void thereon for allowing a radicle of a corresponding plant seed to pierce 15 therethrough and be rooted in the cultivating material while the corresponding plant seed is germinating.

The base comprises light-blocking material for preventing the weeds from growing and is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural 20 decomposing ability. Preferably, the base is a thin layer having a thickness ranged from 0.2 mm to 0.3 mm.

Each of the plural concavities is arranged in the base with a specific interval of distance to adjacent one for effectively increasing the uniformity of nutrition absorption and the usage of growth space of the 25 plant seeds.

After the step b), the method further includes a step b1) of using a securing layer to fix the plant seeds in the plural concavities of the base

so as to induce the radicles of the plant seeds to be rooted in the cultivating material and increase water-absorbing ability of the radicles of the plant seed.

The securing layer is one of a toilet paper and a paper-made towel  
5 and is attached to the base plate for fixing the plant seeds by using an adhesive material.

The adhesive material is glue adapted to uniformly spray glue on the base for attaching the securing layer to the base to fix the plant seeds.

The plant seeds are selected from a group consisting of the seeds of  
10 a cereal, a vegetable, a flower, a forest and a fruit.

In a second aspect, the present invention is related to a base with water-absorbing ability and humidity-maintaining ability for use in sowing the plant seeds to cover a cultivating material therewith comprises a plurality of concavities for allowing the plant seeds to be  
15 inlaid therein, wherein each concavity has a void thereon for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the cultivating material while a plant seed is germinating.

The base comprises light-blocking material for preventing the weeds from growing and is selected from a group consisting of a  
20 mulching paper, a fabric, a fiber and a polymer with natural decomposing ability. Preferably, the base is a thin layer having a thickness ranged from 0.2 mm to 0.3 mm.

In a third aspect, the present invention is related to a mulching paper for use in sowing the plant seeds to cover a cultivating material therewith comprises a plurality of concavities for allowing the plant  
25 seeds to be inlaid therein, wherein each concavity has a void thereon for allowing a radicle of a corresponding plant seed to pierce therethrough

and be rooted in the cultivating material while the corresponding plant seed is germinating.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5       The present invention is directed to a sowing method of the plant seeds and the sowing materials used thereof. The sowing method comprises the steps of a) providing a base with water-absorbing ability and humidity-maintaining ability, wherein the base includes a plurality of concavities, b) inlaying the plant seeds in the plural concavities of the  
10       base, and c) covering a cultivating material with the base, wherein each concavity has a void thereon for allowing a radicle of a corresponding plant seed to pierce therethrough and be rooted in the cultivating material while the corresponding plant seed is germinating. The base comprises light-blocking material for preventing the weeds from  
15       growing and is selected from a group consisting of a mulching paper, a fabric, a fiber and a polymer with natural decomposing ability. Preferably, the base is a thin layer having a thickness ranged from 0.2 mm to 0.3 mm.

20       The present invention may best be understood by the following example which uses a mulching paper as a base.

      First of all, a number of sites of the mulching paper is pressed thereon with a specific interval of distance to adjacent one for forming a plurality of concavities. Each concavity has a void thereon for allowing a radicle of a corresponding plant seed to pierce therethrough and be  
25       rooted in the soil. Thereafter, the plant seeds are inlaid in the plural concavities respectively. Finally, glue is used to be uniformly sprayed on the mulching paper for attaching the securing layer, the toilet paper

(made by YUEN FOONG YU PAPER MFG CO., LTD), to the mulching paper.

5 The toilet paper used herein is for fixing the plant seeds, achieving the objective of soil-covering and inducing the radicles of the plant seeds to be rooted in the soil for absorbing water. Because the mulching paper used herein can prevent the weeds from growing, thus the application of herbicides to control weeds is unnecessary, and the environmental pollution can be avoided. Besides, because of good water-absorbing ability and humidity-maintaining ability of the mulching paper, adequate irrigation and fertilization will expectably increase the germination percentage of the plant seeds as long as the mulching paper is well attached to the surface of soil. In addition, the plural concavities arranged in the mulching paper with a specific interval of distance to adjacent one can not only spread the plants out  
10 uniformly but also increase the uniformity of nutrition absorption and the usage of growth space of the plants. Accordingly, the present invention provides a method for simultaneously proceeding the steps of sowing, soil-covering and weed control for agricultural production, and thus the cost is lowered.

20 As we know, while the mulching paper is spread on the surface of soil in the field, an amount of soil is usually placed on the edge of the mulching for preventing the mulching paper from being blew up or off by the wind. However, the edge of the mulching paper is easily to be torn up by the wind. For obviating this problem, the edge of the mulching paper can be folded back to increase the strength of the edge  
25 of the mulching paper.

### Experiment

At first, the punching-plates are prepared in advance. Then, the punching-plates are immobilized onto the mulching papers (58 x 16 cm) for punching concavities in the mulching papers by the nails. For one  
5 mulching paper, the interval of distance for the punched concavities is 2 cm, and 244 concavities are formed. Then inlaying 244 water convolvulus seeds and cabbage seeds in the concavities of the mulching papers respectively. After the glue is sprayed uniformly on the mulching papers, the toilet paper and the paper-made towel are  
10 respectively attached to the mulching papers for securing the plant seeds. Thereafter, they are air-dried naturally, and the combination of the plant seeds with the mulching paper is accomplished. Finally, the cultivation boxes (60 x 17 x 20 cm) including cultivating soil are covered with the mulching papers. On the other hand, another group of direct sowing, i.e.  
15 the prior art, is prepared for comparison. After these groups are cultivated in the green-house for 21 days, the emergence percentage of the plant seeds, the fresh weigh of the plant, the number of the plant and the weed-controlling capability are shown in Table 1 and Table 2.

From Table 1, there are a lot of differences of the emergence  
20 percentage of the plant seeds, the fresh weigh of the plant, the number of the plant and the weed-controlling capability between the present invention and the prior art. The weed amount is 0.50 according to the present invention, while which is 32.75 according to the prior art. Besides, the weed-controlling capability is 98.47% according to the  
25 present invention, which is much better than that according to the prior art.

From Table 2, there are as well a lot of differences of the emergence percentage of the plant seeds, the fresh weigh of the plant, the number of the plant and the weed-controlling capability between the present invention and the prior art. The weed amount is 1.67 according to the present invention, while which is 46.33 according to the prior art. Besides, the weed-controlling capability is 96.40% according to the present invention, which is as well much better than that according to the prior art.

In conclusion, the emergence percentage of the plant seeds, the fresh weigh of the plant, the number of the plant and the weed-controlling capability according to the present invention are much better than those according to the prior art. The present invention provides a sowing method for simultaneously proceeding the steps of sowing, soil-covering and weed-removal for agricultural production, and time and thus the cost is lowered. Moreover, besides the mulching paper, other kinds of materials, such as the fabric, the fiber and the polymer with natural decomposing ability, can also be used as the base with good water-absorbing ability and humidity-maintaining ability.

Table 1 The cultivation of the water convolvulus.

Cultivation results	Water convolvulus <sup>1</sup>			Weed amount (g)	Weed-controlling capability (%)
	Emergence percentage (%)	Fresh weight (g)	Number		
Present invention	74.83a <sup>3</sup>	287.50a	271.50a	0.50b	98.47
Prior art	9.95b	145.25b	79.75b	32.75a	0.00

1. The counted area is 0.10 square meter.
2. All the data shown are average number of four specimen.
3. According to Duncan's multiple range test,  $p=0.05$ .

5 Table 2 The cultivation of the cabbage.

Cultivation results	Cabbage <sup>1</sup>			Weed amount (g)	Weed- controlling capability (%)
	Emergence percentage (%)	Fresh weight (g)	Number		
Present invention	90.0a <sup>3</sup>	430.00a	201.67a	1.67b	96.40
Prior art	75.44b	211.67b	126.00b	46.33a	0.00

1. The counted area is 0.0928 square meter.
2. All the data shown are average number of four specimen.
3. According to Duncan's multiple range test,  $p=0.05$ .

10 While the invention has been described in terms of what are  
 presently considered to be the most practical and preferred embodiments,  
 it is to be understood that the invention need not be limited to the  
 disclosed embodiment. On the contrary, it is intended to cover various  
 modifications and similar arrangements included within the spirit and  
 15 scope of the appended claims which are to be accorded with the broadest  
 interpretation so as to encompass all such modifications and similar  
 structures. Therefore, the above description and illustration should not  
 be taken as limiting the scope of the present invention which is defined  
 by the appended claims.

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